

<p>30. There are 90 2-digit numbers starting with 10 and ending with 99. Exactly half of them have an even digit-sum. A) 45 B) 48 C) 50 D) 52</p>	<p>30. A</p>
<p>31. 80 km in 60 min. = 8 km in 6 min. = 24 km in 18 min. A) 20 B) 24 C) 28 D) 30</p> <p>32. <math>2^{2005} = 2^1 \times 2^{2004} = 2^{2004} + 2^{2004}</math>. A) 1 B) 2 C) 2004 D) <math>2^{2004}</math></p>	<p>31. B</p> <p>32. D</p>
<p>33. The sum is <math>2+3+5+7+(1+1)+(1+3)+(1+7)+(1+9) = 41</math>. A) 77 B) 76 C) 41 D) 40</p>	<p>33. C</p>
<p>34. If 4 pears weigh as much as 6 peaches, and 6 peaches weigh as much as 90 grapes, then 4 pears weigh as much as 90 grapes. A) 4 B) 6 C) 8 D) 12</p>	<p>34. A</p>
<p>35. The perimeter of the square is 32. A side has length 8, and the area is 64. Half of the square is shaded, so the shaded area is 32. A) 4 B) 8 C) 16 D) 32</p>	<p>35. D</p>
<p>36. <math>(51 - 1) + (52 - 2) + \dots + (99 - 49) + (100 - 50) = 50 + 50 + \dots + 50 + 50 = 50 \times 50 = 2500</math>. A) 2000 B) 2500 C) 2550 D) 5000</p>	<p>36. B</p>
<p>37. I spent \$360 for 110 services, 100 with a smile, 10 without. The 10 without a smile cost as much as 20 with a smile. It costs \$360 for 120 services with a smile, or \$3 for one service with a smile. A) \$3.00 B) \$3.15 C) \$3.30 D) \$3.45</p>	<p>37. A</p>
<p>38. In 24 hours, the hour hand goes around the clock 2 times, the minute hand 24 times, and the second hand <math>60 \times 24 = 1440</math> times. A) 144 B) 1440 C) 1466 D) 86 400</p>	<p>38. C</p>
<p>39. Try <math>2 \times 3 \times 5 = 60</math>, which is divisible by <math>2 \times 3</math>, <math>2 \times 5</math>, <math>3 \times 5</math>, &amp; <math>2 \times 3 \times 5</math>. The product of 3 primes is <i>always</i> divisible by 4 non-primes <math>&gt; 1</math>. A) 1 B) 2 C) 3 D) 4</p>	<p>39. D</p>
<p>40. Keep adding consecutive integers until you reach 120¢: <math>1¢ + 2¢ + 3¢ + \dots + 14¢ + 15¢ = 120¢</math>, so I am 15 years old. A) 10 B) 12 C) 15 D) 20</p>	<p>40. C</p>



# Information & Solutions

Tuesday, March 8 (alternate date: March 15), 2005

## Directions for Grading

6

- **Security and Solutions** Do not look at these solutions until after the contest. Detailed solutions appear in each question box, and letter answers are in the *Answers* columns on the right. You may copy this solution key and give a copy to every student who took this contest.
- **Urgent questions?** Call 1-201-568-6328.
- **Scores** Please remember that *this is a contest, not a test*—and there is no “passing” or “failing” score. Few students score as high as 30 points (75% correct). Students with half that, 15 points, *should be commended!*
- **Awards & Results** The original contest package contained 5 *Certificates of Merit*—1 each for the highest scoring student on each grade level, plus extras for ties. Do you need more *Certificates of Merit*? If so, include your name, school, and school mailing address in a letter to: **Math Certificates, P.O. Box 17, Tenafly, NJ 07670-0017**, and include a self-addressed, stamped envelope (2 stamps required) large enough to hold certificates. Only score reports postmarked by Fri., Mar. 18, 2005, and received by Tues., Mar. 22, 2005 can be used in our *Summary of Contest Results* newsletter, which you'll receive no later than Tues., May 17, 2005.
- **Return of Student Papers** *Originals* of contest papers with scores of 30 or more *must* be held until June 1. *Copies* of these papers, and originals of all other papers, should be returned to students after grading. Students scoring 30 points or more must confirm an *understanding* of the contest rules by signing the *Selected Math League Rules* (on the colored sheet of information and rules that accompanied the contests). Keep this signed sheet with the original contests until June 1. Please do not mail these to the League unless we ask you to do so.

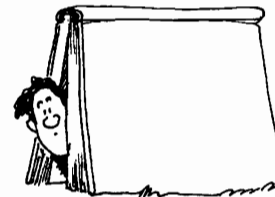
Fifteen books of past contests, *Grades 4, 5, & 6 (Vols. 1, 2, 3, 4, 5)*, *Grades 7 & 8 (Vols. 1, 2, 3, 4, 5)*, and *High School (Vols. 1, 2, 3, 4, 5)*, are available, for \$12.95 per volume (\$15.95 Canadian), from Math League Press, P.O. Box 17, Tenafly, N.J. 07670-0017.

The end of the contest 6

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1. Since  $\frac{1}{2} = 0.5$ ,  $\frac{3}{4} = 0.75$ , &  $0.5 < 0.6 < 0.75$ , choice C is correct.  
A) 0.2      B) 0.4      C) 0.6      D) 0.8
2. A polygon must have 3 or more sides.  
A) 2      B) 3      C) 4      D) 21
3. Since 5 weeks =  $(5 \times 7)$  days = 35 days, I must have watched my mail for 35 days – 5 days = 30 days.  
A) 10      B) 25      C) 30      D) 35
4.  $1010 + 10100 = 11110 = 10 \times 1111$ .  
A) 101      B) 1010      C) 1020      D) 1111
5.  $500\text{¢} \div 10\text{¢} = 50$  and  $1000\text{¢} \div 25\text{¢} = 40$ , and  $50 - 40 = 10$ .  
A) 0      B) 2      C) 5      D) 10
6. Since 10% of # = 100,  $10 \times (10\% \text{ of } \#) = 10 \times 100 = 1000$ .  
A) 10      B) 100      C) 110      D) 1000
7.  $(12+10+8+6+4+2) \div (6+5+4+3+2+1) = 42 \div 21 = 2$ .  
A) 60      B) 45      C) 6      D) 2
8. Divide each answer choice by 2, then check for a multiple of 6.  
A) 28      B) 30      C) 36      D) 42
9.  $54 \div 3 = 18 = 3 \times 6$ .      A) 6      B) 18      C) 54      D) 162
10. The area of the wall is  $4 \times 4 = 16$ . Since the roll covers half the wall, the area of the part covered by this roll is 8.  
A) 4      B) 8      C) 16      D) 32
11. I need 12 pieces of fruit to make 3 glasses of juice, so I need 4 pieces to make 1 glass. I need  $4 \times 10 = 40$  pieces for 10 glasses.  
A) 30      B) 36      C) 40      D) 120
12. The only positive divisor of 100 that is a multiple of 100 is 100.  
A) 1      B) 10      C) 25      D) 100
13. A *hendecagon* is an 11-sided polygon. The product of the number of sides of a hendecagon and of a square is  $11 \times 4 = 44$ .  
A) 44      B) 55      C) 66      D) 88
14. (number of 0s in 1000):(number of 0s in 1 000 000) =  $3:6 = 1:2$ .  
A) 1:1      B) 1:2      C) 2:3      D) 4:7
15. Every even number has a factor of 2, and 2 is an even prime.  
A) even      B) odd      C) prime      D) whole



16. In 1 second, your rocket flies  $300 \text{ m} = 300 \times 100 \text{ cm} = 30\,000 \text{ cm}$  and my pet runs  $300 \text{ cm}$ . Speed ratio =  $30\,000:300 = 100:1 = 100$ .  
A) 30 000      B) 10 000      C) 300      D) 100
17. As shown below, the sum can be any of the choices *except* C.  
A)  $12 = 4+8$       B)  $18 = 2+16$       C) 32      D)  $33 = 1+32$
18. The avg. of any odd # of *consecutive* integers is the middle one.  
A) 15      B) 16      C) 19      D) 135
19. Since each act has 4 scenes, there are  $3 \times 4 = 12$  scenes in all. The total number of characters in the play is  $2 \times 12 = 24$ .  
A) 6      B) 8      C) 12      D) 24
20. If  $\frac{3}{4}$  are bills, then  $\frac{1}{4}$  are not. The ratio of the # of bills to the # of other letters is  $(\frac{3}{4}):(\frac{1}{4}) = 3:1$ .  
A) 7:1      B) 7:3      C) 3:1      D) 3:4
21.  $4 \times 4^4 = 4^1 \times 4^4 = 4^{1+4} = 4^5$ .  
A)  $4^4$       B)  $4^5$       C)  $14^4$       D)  $16^5$
22. For choices B, C, D, (# pennies, # nickels, # dimes) is shown.  
A) 11¢      B) 19¢ (9,0,1)      C) 30¢ (5,5,0)      D) 31¢ (6,3,1)
23. Of the choices listed, only 900 is the square of an integer.  
A) 600      B) 700      C) 800      D) 900
24. 75 nickels =  $375\text{¢} = (375 \div 25)$  quarters = 15 quarters.  
A) 3      B) 15      C) 25      D) 375
25. There is no factor of 7 in  $30 \times 40 \times 50$ , so choice C is correct.  
A)  $1 \times 3 \times 5$       B)  $2 \times 4 \times 6$       C)  $5 \times 7 \times 9$       D)  $6 \times 8 \times 10$
26. Ten years ago, Ted's age was  $(22 \div 2) = 11$ . His age today is  $11 + 10 = 21$ .  
A) 16      B) 21      C) 32      D) 42
27. If all tents hold 2, we can hold only 12. But if 3 hold 2 and 3 hold 4, we can hold  $(3 \times 2) + (3 \times 4) = 18$  campers.  
A) 4      B) 3      C) 2      D) 1
28. If 3 out of 5 dentists recommend sugarless gum, then 2 out of 5 = 20 out of 50 = 40 out of 100 = 40% *don't*.  
A) 20%      B) 30%      C) 40%      D) 60%
29. 6 mins. after noon is 12:06 P.M.; 6 hrs. before that is 6:06 A.M.  
A) 6:06 A.M.      B) 6:06 P.M.      C) 5:54 A.M.      D) 5:54 P.M.